Patent Claims:

1. Organic electroluminescent device comprising cathode and anode and at least one emission layer, characterised in that the emission layer
   - comprises at least one matrix material A, which comprises at least one element having an atomic number ≥ 15, with the proviso that the matrix material comprises none of the elements Si, Ge, Sn, Pb, Al, Ga, In or Tl, is not a noble-gas compound, furthermore with the proviso that matrix materials A having the partial-structure L=X are excluded, where L stands for a substituted C, P, As, Sb, Bi, S, Se or Te and X has at least one non-bonding electron pair, with the proviso that tetraaryl compounds of the elements Se, Ti, Zr and Hf are excluded, and with the proviso that metal complexes of the quinoxolates, oxadiazoles and triazoles are excluded as matrix material; and
   - comprises at least one emission-capable emission material B which emits light on suitable excitation from the triplet state and comprises at least one element having an atomic number of greater than 20.

2. Organic electroluminescent device according to Claim 1, characterised in that the matrix material A comprises a main-group element.

3. Organic electroluminescent device according to Claim 2, characterised in that the matrix material A comprises phosphorus, arsenic, antimony and/or bismuth.

4. Organic electroluminescent device according to Claim 2, characterised in that the matrix material A comprises sulfur, selenium and/or tellurium.

5. Organic electroluminescent element according to Claim 3 and/or 4, characterised in that the element having an atomic number ≥ 15 is substituted by at least one substituted or unsubstituted, aromatic or heteroaromatic ring system having 3 to 60 C atoms.

6. Organic electroluminescent element according to Claim 5, comprising, as matrix material A, at least one compound of the formula (A) or formula (B)

$X(Ar)_3$	$Y(Ar)_2$
Formula (A)	Formula (B)

where the following applies to the symbols used:

X is on each occurrence P, As, Sb or Bi, preferably P or As;

Y is on each occurrence S, Se or Te, preferably S or Se;

Ar is on each occurrence, identically or differently, an aromatic or hetero-aromatic ring system having 3 to 60 C atoms, which may be substituted by F or organic radicals having 1 to 40 C atoms, preferably an aromatic ring system having 6 to 40 C atoms.

7. Organic electroluminescent element according to Claim 6, characterised in that the aromatic ring system is selected from the group consisting of phenyl, biphenyl, terphenyl, naphthyl, anthryl, phenanthrenyl, pyryl, fluorenyl, spirobifluorenyl, dihydrophenanthrenyl, tetrahydropyrenyl or a combination of 2 or 3 of these systems.

8. Organic electroluminescent device according to Claim 1, characterised in that the matrix material A comprises at least one transition-metal element and/or a lanthanoid element.

9. Organic electroluminescent device according to one or more of Claims 2 to 8, characterised in that the emission layer comprises a mixture of at least two of these matrix materials.

10. Organic electroluminescent device according to one or more of Claims 1 to 9, characterised in that the triplet energy of the matrix material A is between 2 and 4 eV.

11. Organic electroluminescent device according to one or more of Claims 1 to 10, characterised in that the triplet energy of the matrix material A is greater than the triplet energy of the triplet emitter B used.

12. Organic electroluminescent device according to one or more of Claims 1 to 11, characterised in that the matrix material A is amorphous.

13. Organic electroluminescent device according to Claim 12, characterised in that the matrix material A has a glass transition temperature T_g of greater than 90°C.

14. Organic electroluminescent device according to one or more of Claims 1 to 13, characterised in that the matrix materials A are uncharged compounds.

15. Organic electroluminescent device according to one or more of Claims 1 to 14, characterised in that the LUMO of the matrix material A is higher than the HOMO of the triplet emitter B and that the LUMO of the triplet emitter B is higher than the HOMO of the matrix material A.

16. Organic electroluminescent device according to one or more of Claims 1 to 15, characterised in that the HOMO of the compound having the less negative HOMO in the emission layer is in the region of ± 0.5 eV of the HOMO of the layer adjacent to the emission layer on the anode side.

17. Organic electroluminescent device according to one or more of Claims 1 to 16, characterised in that the LUMO of the compound having the more negative LUMO in the emission layer is in the region of ± 0.5 eV of the LUMO of the layer adjacent to the emission layer on the cathode side.

18. Organic electroluminescent device according to one or more of Claims 1 to 17, characterised in that the dipole moment of the molecular fragment around the element having an atomic number ≥ 15 is other than zero.

19. Organic electroluminescent device according to one or more of Claims 1 to 18, characterised in that the matrix materials A are discrete molecular or coordinative compounds which also form discrete structures in the solid state.

20. Organic electroluminescent device according to one or more of Claims 1 to 19, characterised in that the matrix material A used is a compound which can itself also emit light from the triplet state.

21. Organic electroluminescent device according to one or more of Claims 1 to 20, characterised in that the layers of matrix material A and triplet emitter B are applied to a substrate by vacuum vapour deposition, vapour deposition in a stream of carrier gas or from solution by spin coating or by means of printing processes.

22. Organic electroluminescent device according to one or more of Claims 1 to 21, characterised in that the triplet emitter B comprises at least one atom having an atomic number of greater than 38 and less than 84.

23. Organic electroluminescent device according to Claim 22, characterised in that the triplet emitter comprises at least one of the elements molybdenum, tungsten, rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum, silver, gold or europium.

24. Organic electroluminescent device according to Claim 22 and/or 23, characterised in that a mixture of at least two triplet emitters B is used.

25. Organic electroluminescent device according to one or more of Claims 1 to 24, characterised in that the emission layer comprises 1 to 99% by weight of one or more matrix compounds A and 99 to 1% by weight of one or more emitters B, based on the total composition of the emission layer.

26. Organic electroluminescent device according to Claim 25, characterised in that the emission layer comprises 80 to 93% by weight of one or more matrix compounds A and 20 to 7% by weight of one or more emitters B, based on the total composition of the emission layer.

27. Organic electroluminescent device according to one or more of Claims 1 to 26, characterised in that further layers are present in addition to the cathode, the anode and the emitter layer.

28. Organic electroluminescent device according to Claim 27, characterised in that at least one hole-injection layer, which may also be doped, and/or at least one hole-transport layer, which may also be doped, and/or at least one hole-blocking layer and/or at least one electron-transport layer, which may also be doped, and/or at least one electron-injection layer, which may also be doped, is present.

29. Organic electroluminescent device according to one or more of Claims 1 to 28, characterised in that the emission layer is directly adjacent to the electron-transport layer without the use of a hole-blocking layer or in that it is directly adjacent to the electron-injection layer or the cathode without the use of a hole-blocking layer and electron-transport layer.

30. Organic electroluminescent device according to one or more of Claims 1 to 29, characterised in that the emission layer is directly adjacent to the hole-injection layer without the use of a hole-transport layer or in that it is directly adjacent to the anode without the use of a hole-transport layer and a hole-injection layer.